

SEPTEMBER 18 ASSIGNMENT

Please answer all of the questions on a separate piece of paper. You need to show all of your work. Make sure to write legibly!

1. Using only the number 4, find ways to create all the numbers from 1-18. You can use add, subtract, multiply, divide, square root, exponents, and parentheses.
2. You put brand new tires on your car. The tires can run 21000 km on the front wheels and 29000 km on the rear wheels. (Let's suppose that the tires are getting used up proportionally with the distance.) The car has a new spare tire also. What is the maximum distance you can drive using the 5 new tires if you may rotate them at your wish? (Give me the schedule of rotation of the tires, also.)
3. Henry goes to a casino in Las Vegas with \$5120 to play a game called "double or nothing". He always puts up half of his money for a bet. He bets 10 times, out of which he wins five times and loses the other five bets but we do not know in what order. How much money could he possibly have at the end?
4. A new laundry detergent is promoted at the stores. They packed each bag of detergent with a small bucket. If you buy more than one package, they give you a discount: if you buy two packages you get a 10% discount, and for every additional package you buy, you get a 20 % discount. The full price of a package (a bag of detergent + the bucket) is \$30. If you wanted to buy a bucket separately, it would cost you \$5. At least how many packages do you have to buy so that the buckets would come out to be free?
5. The teacher gives the following homework assignment: You have to write an essay by tomorrow. You may work alone or in boy-girl pairs. As it turned out, $\frac{2}{3}$ of the boys and $\frac{3}{5}$ of the girls worked in pairs. What fraction of the class worked alone?
6. How many rectangles are there on a 4x4 chessboard? How many of these are squares? Make sure you count ALL of them!
7. Place a circle, a square, and an equilateral triangle on top of each other so that their lines would have the most intersection points. What is this number of intersection points? (You may choose the size of each figure.)